



west virginia department of environmental protection

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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.: R13-2968
Plant ID No.: 033-00207
Applicant: MarkWest Liberty Midstream & Resources LLC (MarkWest)
Facility Name: Zinnia Compressor Station
Location: Salem, Harrison County
NAICS Code: 211111
Application Type: Construction
Received Date: August 9, 2012
Engineer Assigned: Jerry Williams, P.E. (Reassigned December 17, 2012)
Fee Amount: \$2,000.00
Date Received: August 9, 2012
Complete Date: January 22, 2013
Due Date: April 22, 2013
Applicant Ad Date: October 24, 2012
Newspaper: *The Exponent-Telegram*
UTM's: Easting: 538.559 km Northing: 4,341.917 km Zone: 17
Description: Proposal to construct and operate a natural gas compressor station with six (6) natural gas fired reciprocating internal combustion engines, one (1) tri-ethylene glycol (TEG) dehydration unit with associated reboiler and flare, five (5) storage tanks with a vapor recovery unit (VRU), two (2) diesel generators, and related fugitive emissions.

DESCRIPTION OF PROCESS

The following process description was taken from Permit Application R13-2968:

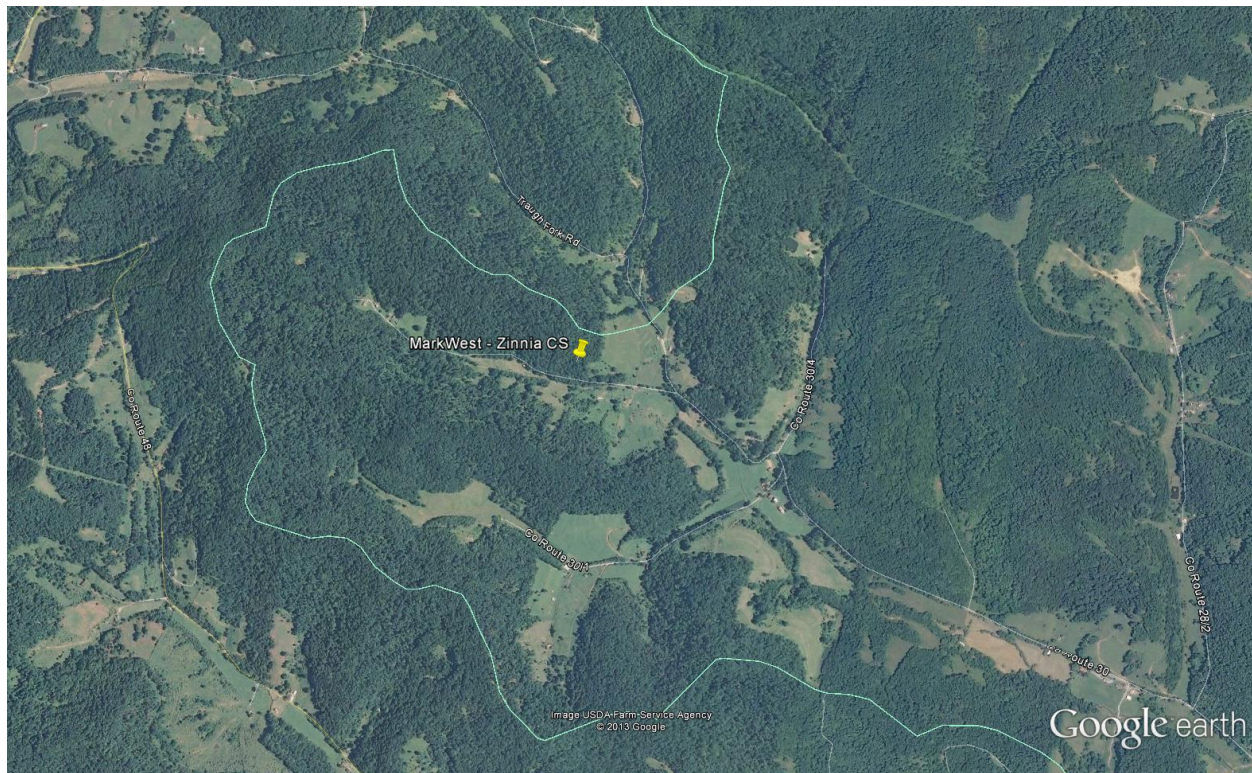
The Zinnia Compressor Station will be used as a compressor station to gather and dehydrate gas from gas wells throughout the surrounding areas. The natural gas inlet stream from surrounding area wells enters the facility through an inlet separator. The gas is then compressed in one of six (6) compressor units powered with the Caterpillar G3608 engines. After compression the gas will pass through the TEG dehydration unit, which is designed to remove hydrates (water) from the gas stream. The rich TEG is routed to the reboiler where water and organic impurities are driven from the TEG as the reboiler is heated. Throughout the

process there are points of lower temperatures or pressures that may drop heavier hydrocarbons into a liquid state. After passing through the TEG dehydration unit, the dry natural gas is sent into a pipeline to a processing plant where further treatment and removal of hydrocarbon liquids will occur. Storage tanks at the compressor station will be atmospheric tanks with emissions controlled with a VRU rated at 98% recovery efficiency. The Zinnia Compressor Station will be capable of gathering and compressing up to 120 million standard cubic feet per day (mmscfd) of natural gas. There will also be a natural gas fired Caterpillar generator driven by a 1,085 hp G3516LE engine.

SITE INSPECTION

A site inspection was conducted on February 11, 2013 by Lou Ann Lee of the WVDEP North Central Regional Office (NCRO). Allowable activities covered under 45CSR13 Section 5.1 have taken place. The site was acceptable.

Latitude: 39.225689
Longitude: -80.553283



ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emissions associated with this application consist of the combustion emissions from six (6) natural gas fired compressor engines (CM-1001 – CM-1006), one (1) natural gas fired generator (GE-1), one (1) TEG dehydration unit (DH-001), one (1) dehydration unit reboiler (RB-001), one (1) dehydration unit flare (FL-991), five (5) storage tanks (T01 – T05), and fugitive emissions (FUG-001). The following table indicates which methodology was used in the emissions determination:

Emission Unit ID#	Process Equipment	Calculation Methodology
CM-1001 – CM-1006	2,370 hp Caterpillar G3608 LE Compressor Engines w/ oxidation catalyst ¹	Manufacturer's Data, EPA AP-42 Emission Factors
GE-1	1,085 hp Caterpillar G3516 LE Compressor Engine w/ oxidation catalyst ¹	Manufacturer's Data, EPA AP-42 Emission Factors
DH-001	120 mmscfd TEG Dehydration Unit	GRI-GLYCalc Version 4.0
RB-001	2.0 MMBTU/hr Dehydration Unit Reboiler	EPA AP-42 Emission Factors
FL-991	7.0 MMBTU/hr Dehydration Unit Flare	EPA AP-42 Emission Factors
T01 – T05	Condensate Storage Tanks w/ VRU	Aspen HY-SYS Modeling Software

¹ Per Caterpillar, NMNEHC emission factor does not include formaldehyde, therefore, NMNEHC and formaldehyde factors have been added to arrive at total VOC. In addition, per AP-42, all PM from combustion of natural gas (total, condensable, and filterable PM) is presumed < 1 micrometer.

The following table indicates the control device efficiencies that are required for this facility:

Emission Unit	Pollutant	Control Device	Control Efficiency
CM-1001 – CM-1006	Carbon Monoxide	Oxidation Catalyst	95 %
	Volatile Organic Compounds		77 %
	Formaldehyde		90 %
GE-1	Carbon Monoxide	Oxidation Catalyst	50 %
	Volatile Organic Compounds		40 %
T01 – T05	Volatile Organic Compounds	Vapor Recovery Unit	98 %
	Total HAPs		98 %

Maximum controlled point source emissions were calculated by MarkWest and checked for accuracy by the writer and are summarized in the table below.

Emission Point ID#	Source	Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (tpy)
CE-1 -- CE-6 each	2,370 hp Caterpillar G3608LE Compressor Engines	Nitrogen Oxides	2.61	11.44
		Carbon Monoxide	0.73	3.20
		Particulate Matter-10	<0.01	0.01
		Sulfur Dioxide	0.01	0.05
		Volatile Organic Compounds	1.62	7.09
		Formaldehyde	0.16	0.69
		Total HAPs	0.50	2.20
		Carbon Dioxide Equivalent	2,147	9,403
GE-1	1,085 hp Caterpillar G3516 LE Compressor Engine	Nitrogen Oxides	2.39	10.48
		Carbon Monoxide	2.99	13.10
		Particulate Matter-10	<0.01	<0.01
		Sulfur Dioxide	<0.01	0.02
		Volatile Organic Compounds	0.72	3.14
		Formaldehyde	0.44	1.92
		Total HAPs	0.60	2.63
		Carbon Dioxide Equivalent	1,003	4,392
DH-001	120 mmscf TEG Dehydration Unit	Volatile Organic Compounds	2.05	8.98
		Benzene	0.04	0.16
		Toluene	0.13	0.55
		Xylenes	0.07	0.31
		n-Hexane	0.09	0.39
		Total HAPs	0.32	1.38
	2.0 MMBTU/hr Dehydration Unit	Nitrogen Oxides	0.17	0.73
		Carbon Monoxide	0.14	0.62
		Particulate Matter-10	<0.01	0.02

RB-001	Reboiler	Sulfur Dioxide	<0.01	<0.01
		Volatile Organic Compounds	<0.01	0.04
		Formaldehyde	<0.01	<0.01
		Total HAPs	<0.01	0.02
		Carbon Dioxide Equivalent	241	1,057
FL-991	7.0 MMBTU/hr Dehydration Unit Flare	Nitrogen Oxides	0.59	2.56
		Carbon Monoxide	0.49	2.15
		Particulate Matter-10	0.04	0.15
		Sulfur Dioxide	<0.01	0.02
		Volatile Organic Compounds (included with DH-001)	2.05	8.98
		Total HAPs (included with DH-001)	0.32	1.38
		Carbon Dioxide Equivalent	733	3,211
T01 - T05	Condensate Storage Tanks	Volatile Organic Compounds	3.56	8.80
		Total HAPs	0.27	0.86
		Carbon Dioxide Equivalent	66	206
Fugitive	Fugitive Emissions	Volatile Organic Compounds	0.41	1.81
		Total HAPs	0.04	0.15

The total facility emissions for the proposed Zinnia Compressor Station are shown in the following table:

Pollutant	Facility Wide Annual Emissions (tons/year)
Nitrogen Oxides	82.42
Carbon Monoxide	35.08
Volatile Organic Compounds	69.45
Particulate Matter	5.28
Sulfur Dioxide	0.32
Formaldehyde	6.04
Total HAPs	18.22
Carbon Dioxide Equivalent	65,282

REGULATORY APPLICABILITY

Unless otherwise stated WVDEP DAQ did not determine whether the permittee is subject to an area source air toxics standard requiring Generally Achievable Control Technology (GACT) promulgated after January 1, 2007 pursuant to 40 CFR 63, including the area source air toxics provisions of 40 CFR 63, Subparts ZZZZ and HH.

The following rules apply to the facility:

45CSR2 (Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers)

The purpose of 45CSR2 is to establish emission limitations for smoke and particulate matter which are discharged from fuel burning units. 45CSR2 states that any fuel burning unit that has a heat input under ten (10) million B.T.U.'s per hour is exempt from sections 4 (weight emission standard), 5 (control of fugitive particulate matter), 6 (registration), 8 (testing, monitoring, recordkeeping, reporting) and 9 (startups, shutdowns, malfunctions). However, failure to attain acceptable air quality in parts of some urban areas may require the mandatory control of these sources at a later date.

The individual heat input of the proposed reboiler (RB-001) is below 10 MMBTU/hr. Therefore, this unit is exempt from the aforementioned sections of 45CSR2.

MarkWest also would be subject to the opacity requirements in 45CSR2, which is 10% opacity based on a six minute block average.

45CSR6 (To Prevent and Control Air Pollution from the Combustion of Refuse)

The purpose of this rule is to prevent and control air pollution from combustion of refuse.

MarkWest has proposed to have one (1) flare at the facility. The flare is subject to section 4, emission standards for incinerators. The flare has an allowable emission rate of 256.6 pounds of particulate matter per hour (assuming a natural gas density of 0.044 lb/ft³). The flare has an hourly particulate matter emissions rate of 0.044 lb/hr. Therefore, the facility's flare should demonstrate compliance with this section. The facility will demonstrate compliance by maintaining records of the amount of natural gas consumed by the flare and the hours of operation. The facility will also monitor the flame of the flare and record any malfunctions that may cause no flame to be present during operation.

45CSR10 (To Prevent and Control Air Pollution from the Emissions of Sulfur Oxides)

The purpose of 45CSR10 is to establish emission limitations for sulfur dioxide which are discharged from fuel burning units. 45CSR10 states that any fuel burning unit that has a heat input under ten (10) million B.T.U.'s per hour is exempt from sections 3 (weight emission standard), 6 (registration), 7 (permits), and 8 (testing, monitoring, recordkeeping, reporting). However, failure to attain acceptable air quality in parts of some urban areas may require the mandatory control of these sources at a later date.

The individual heat input of the proposed reboiler (RB-001) is below 10 MMBTU/hr. Therefore, this unit is exempt from the aforementioned sections of 45CSR10.

45CSR13 (Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation)

45CSR13 applies to this source due to the fact that MarkWest exceeds the regulatory emission threshold for criteria pollutants of 6 lb/hr and 10 ton/year, and they are also subject to a substantive requirement of an emission control rule promulgated by the Secretary (40CFR60 Subparts JJJJ and OOOO).

MarkWest paid the appropriate application fee and published the required legal advertisement for a construction permit application.

45CSR16 (Standards of Performance for New Stationary Sources Pursuant to 40 CFR Part 60)

45CSR16 applies to this source by reference of 40CFR60, Subparts JJJJ and OOOO. These requirements are discussed under that rule below.

45CSR22 (Air Quality Management Fee Program)

MarkWest is not subject to 45CSR30. The Zinnia Compressor Station is subject to 40CFR60 Subparts JJJJ and OOOO, however they are exempt from the obligation to obtain a permit under 40 CFR part 70 or 40 CFR part 71, provided they are not required to obtain a permit for a reason other than their status as an area source.

MarkWest is required to pay the appropriate annual fees and keep their Certificate to Operate current.

40CFR60 Subpart JJJJ (Standards of Performance for Stationary Spark Ignition Internal Combustion Engines (SI ICE))

40CFR60 Subpart JJJJ is applicable to owners and operators of new stationary spark ignition internal combustion engines manufactured after July 1, 2007, for engines with a maximum rated power capacity greater than 500 hp.

The proposed 2,370 hp Caterpillar G3608LE compressor engines (CE-1 – CE-6) will be subject to the following emission limits: NO_x – 1.0 g/hp-hr (5.23 lb/hr); CO – 2.0 g/hp-hr (10.45 lb/hr); and VOC – 0.7 g/hp-hr (3.66 lb/hr). Based on the manufacturer's specifications for these engines, the emission standards will be met.

The proposed 1,380 hp Caterpillar G3516B compressor engine (GE-1) will be subject to the following emission limits: NO_x – 1.0 g/hp-hr (3.04 lb/hr); CO – 2.0 g/hp-hr (6.08 lb/hr); and VOC – 0.7 g/hp-hr (2.13 lb/hr). Based on the manufacturer's specifications for these engines, the emission standards will be met.

In addition, the proposed engines are not certified by the manufacturer to meet the emission standards listed in 40CFR60 Subpart JJJJ. Therefore, MarkWest will be required to conduct an initial performance test and conduct subsequent performance testing every 8,760 hours or three (3) years, whichever comes first, to demonstrate compliance.

40CFR60 Subpart OOOO (Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution)

EPA published in the Federal Register new source performance standards (NSPS) and air toxics rules for the oil and gas sector on August 16, 2012. 40CFR60 Subpart OOOO establishes emission standards and compliance schedules for the control of volatile organic compounds (VOC) and sulfur dioxide (SO₂) emissions from affected facilities that commence construction, modification or reconstruction after August 23, 2011. The following affected sources which commence construction, modification or reconstruction after August 23, 2011 are subject to the applicable provisions of this subpart:

- a. Each gas well affected facility, which is a single natural gas well.

There are no gas wells at this facility. Therefore, all requirements regarding gas well affected facilities under 40 CFR 60 Subpart OOOO would not apply.

- b. Each centrifugal compressor affected facility, which is a single centrifugal compressor using wet seals that is located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment. For the purposes of this subpart, your centrifugal compressor is considered to have commenced construction on the date the compressor is installed (excluding relocation) at the facility. A centrifugal compressor located at a well site, or an adjacent well site and servicing more than one well site, is not an affected facility under this subpart.

There are no centrifugal compressors at the Zinnia Compressor Station. Therefore, all requirements regarding centrifugal compressors under 40 CFR 60 Subpart OOOO would not apply.

- c. Each reciprocating compressor affected facility, which is a single reciprocating compressor located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment. For the purposes of this subpart, your reciprocating compressor is considered to have commenced construction on the date the compressor is installed (excluding relocation) at the facility. A reciprocating compressor located at a well site, or an adjacent well site and servicing more than one well site, is not an affected facility under this subpart.

There are reciprocating internal combustion engines located at the Zinnia Compressor Station that were constructed after August 23, 2011. Therefore, the requirements regarding reciprocating compressors under 40 CFR 60 Subpart OOOO would apply. MarkWest would be required to perform the following:

- Replace the reciprocating compressor rod packing at least every 26,000 hours of operation or 36 months.
- Demonstrate initial compliance by continuously monitoring the number of hours of operation or track the number of months since the last rod packing replacement.
- Submit the appropriate start up notifications.
- Submit the initial annual report for the reciprocating compressors.
- Maintain records of hours of operation since last rod packing replacement, records of the date and time of each rod packing replacement, and records of deviations in cases where the reciprocating compressor was not operated in compliance.

- d. Pneumatic Controllers

- Each pneumatic controller affected facility, which is a single continuous bleed natural gas-driven pneumatic controller operating at a natural gas bleed rate greater than 6 scfh which commenced construction after August 23, 2011, and is located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment and not located at a natural gas processing plant.
- Each pneumatic controller affected facility, which is a single continuous bleed natural gas-driven pneumatic controller which commenced construction after August 23, 2011, and is located at a natural gas processing plant.

There will be applicable pneumatic controllers at the Zinnia Compressor Station. Therefore, the requirements regarding pneumatic controllers under 40 CFR 60 Subpart OOOO would apply. MarkWest would be required to perform the following:

- Each pneumatic controller located between the wellhead and a natural gas processing plant must have a bleed rate less than or equal to 6 standard cubic feet per hour (scfh).
 - Each pneumatic controller must be tagged with the month and year of installation, reconstruction, or modification, and identification information that allows traceability to the records for that controller.
 - Submit the appropriate start up notifications.
 - Submit the applicable annual reports for pneumatic controllers.
 - Maintain records of the date, location and manufacturer specifications for each pneumatic controller, records of the demonstration that the used of pneumatic controllers with a natural gas bleed rate greater than 6 scfh are required and the reasons why, records of the manufacturer's specifications indicating that the controller is designed such that the natural gas bleed rate is less than or equal to 6 scfh, records of deviations in cases where the pneumatic controllers was not operated in compliance.
- e. Each storage vessel affected facility, which is a single storage vessel, located in the oil and natural gas production segment, natural gas processing segment or natural gas transmission and storage segment.

40CFR60 Subpart OOOO defines a storage vessel as a unit that is constructed primarily of nonearthen materials (such as wood, concrete, steel, fiberglass, or plastic) which provides structural support and is designed to contain an accumulation of liquids or other materials. The following are not considered storage vessels:

- Vessels that are skid-mounted or permanently attached to something that is mobile (such as trucks, railcars, barges or ships), and are intended to be located at a site for less than 180 consecutive days. If the source does not keep or are not able to produce records, as required by §60.5420(c)(5)(iv), showing that the vessel has been located at a site for less than 180 consecutive days, the vessel described herein is considered to be a storage vessel since the original vessel was first located at the site.
- Process vessels such as surge control vessels, bottoms receivers or knockout vessels.
- Pressure vessels designed to operate in excess of 204.9 kilopascals and without emissions to the atmosphere.

This rule requires that the permittee determine the VOC emission rate for each storage vessel affected facility utilizing a generally accepted model or calculation methodology within 30 days of startup, and minimize emissions to the extent practicable during the 30 day period using good engineering practices. For each storage vessel affected facility that emits more than 6 tpy of VOC, the permittee must reduce VOC emissions by 95% or greater within 60 days of startup. The compliance date for applicable storage vessels is October 15, 2013.

The storage vessels located at the Zinnia Compressor Station will be controlled by a VRU which will reduce the potential to emit to less than 6 tpy of VOC. Therefore, MarkWest is not required by this section to reduce VOC emissions by 95%.

- f. The group of all equipment, except compressors, within a process unit is an affected facility.
- Addition or replacement of equipment for the purpose of process improvement that is accomplished without a capital expenditure shall not by itself be considered a modification under this subpart.
 - Equipment associated with a compressor station, dehydration unit, sweetening unit, underground storage vessel, field gas gathering system, or liquefied natural gas unit is covered by §§60.5400, 60.5401, 60.5402, 60.5421 and 60.5422 of this subpart if it is located at an onshore natural gas processing plant. Equipment not located at the onshore natural gas processing plant site is exempt from the provisions of §§60.5400, 60.5401, 60.5402, 60.5421 and 60.5422 of this subpart.
 - The equipment within a process unit of an affected facility located at onshore natural gas processing plants and described in paragraph (f) of this section are exempt from this subpart if they are subject to and controlled according to subparts VVa, GGG or GGGa of this part.

The Zinnia Compressor Station is not a natural gas processing plant. Therefore, Leak Detection and Repair (LDAR) requirements for onshore natural gas processing plants would not apply.

- g. Sweetening units located at onshore natural gas processing plants that process natural gas produced from either onshore or offshore wells.
- Each sweetening unit that processes natural gas is an affected facility; and
 - Each sweetening unit that processes natural gas followed by a sulfur recovery unit is an affected facility.
 - Facilities that have a design capacity less than 2 long tons per day (LT/D) of hydrogen sulfide (H₂S) in the acid gas (expressed as sulfur) are required

to comply with recordkeeping and reporting requirements specified in §60.5423(c) but are not required to comply with §§60.5405 through 60.5407 and paragraphs 60.5410(g) and 60.5415(g) of this subpart.

- Sweetening facilities producing acid gas that is completely reinjected into oil-or-gas-bearing geologic strata or that is otherwise not released to the atmosphere are not subject to §§60.5405 through 60.5407, 60.5410(g), 60.5415(g), and 60.5423 of this subpart.

There are no sweetening units at the Zinnia Compressor Station. Therefore, all requirements regarding sweetening units under 40 CFR 60 Subpart OOOO would not apply.

The following rules do not apply to the facility:

45CSR30 (Requirements for Operating Permits)

MarkWest is not subject to 45CSR30. The Zinnia Compressor Station is subject to 40CFR60 Subparts JJJJ and OOOO, however they are exempt from the obligation to obtain a permit under 40 CFR part 70 or 40 CFR part 71, provided they are not required to obtain a permit for a reason other than their status as an area source.

40CFR60 Subpart KKK (Standards of Performance for Equipment Leaks of VOC from Onshore Natural Gas Processing Plants)

40CFR60 Subpart KKK applies to onshore natural gas processing plants that commenced construction after January 20, 1984, and on or Before August 23, 2011. The Zinnia Compressor Station is not a natural gas processing facility, therefore, MarkWest is not subject to this rule.

45CSR14 (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollutants)

45CSR19 (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution which Cause or Contribute to Nonattainment)

The Zinnia Compressor Station is located in Harrison County, whose attainment status is unclassified. Because Harrison County is not classified as a non-attainment county, 45CSR19 does not apply to this facility.

As shown in the table below, MarkWest is not subject to 45CSR14 or 45CSR19 review.

Pollutant	PSD (45CSR14) Threshold (tpy)	NANSR (45CSR19) Threshold (tpy)	Zinnia CS PTE (tpy)	45CSR14 or 45CSR19 Review Required?
Carbon Monoxide	250	NA	35.08	No
Nitrogen Oxides	250	NA	82.42	No
Sulfur Dioxide	250	NA	0.32	No
Particulate Matter 2.5	250	NA	5.28	No
Ozone (VOC)	250	NA	69.45	No
Greenhouse Gas (CO ₂ e)	100,000	NA	65,282	No

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

There will be small amounts of various non-criteria regulated pollutants emitted from the combustion of natural gas. However, due to the concentrations emitted, detailed toxicological information is not included in this evaluation.

AIR QUALITY IMPACT ANALYSIS

Modeling was not required of this source due to the fact that the facility is not subject to 45CSR14 (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollutants) as seen in the table listed in the Regulatory Discussion Section.

SOURCE AGGREGATION

“Building, structure, facility, or installation” is defined as all the pollutant emitting activities which belong to the same industrial grouping, are located on one or more contiguous and adjacent properties, and are under the control of the same person.

The Zinnia Compressor Station is located in Harrison County and will be operated by MarkWest.

1. The Zinnia Compressor Station will operate under SIC code 1311 (Crude Petroleum and Natural Gas Extraction). There are surrounding compressor stations operated by MarkWest that share the same two-digit major SIC code of 13 for oil and gas exploration and production. However, MarkWest does not own or operate any gas wells. Therefore, the Zinnia Compressor Station does share the same SIC code as the surrounding compressor stations.
2. “Contiguous or Adjacent” determinations are made on a case by case basis. These determinations are proximity based, and it is important to focus on this and whether or not it meets the common sense notion of a plant. The terms “contiguous” or “adjacent” are not defined by USEPA. Contiguous has a dictionary definition of being in actual contact; touching along a boundary or at a point. Adjacent has a dictionary definition of not distant; nearby; having a common endpoint or border.

MarkWest does own and operate the Sherwood Gas Plant, a processing facility which is undergoing permit review, which is located 7.9 miles from the proposed Zinnia Compressor Station. MarkWest also owns and operates the Midpoint Compressor Station which is located 7.1 miles from the proposed Zinnia Compressor Station. Operations separated by these distances do not meet the common sense notion of a plant. Therefore, the properties in question are not considered to be on contiguous or adjacent property.

3. The proposed Zinnia Compressor Station is under common control with the Sherwood Gas Plant and Midpoint Compressor Station, but not with any wells that would feed the proposed Zinnia Compressor Station. From this analysis, MarkWest is under common control with other facilities in the area.

Because the facilities are not considered to be on contiguous or adjacent properties, the emissions from the proposed Zinnia Compressor Station should not be aggregated with other facilities in determining major source or PSD status.

MONITORING OF OPERATIONS

MarkWest will be required to perform the following monitoring:

1. Monitor and record quantity of natural gas consumed for all engines and combustion sources.
2. Monitor the presence of the flare pilot flame with a thermocouple or equivalent.
3. Monitor all applicable requirements of 40CFR60 Subparts JJJJ and OOOO.

MarkWest will be required to perform the following recordkeeping:

1. Maintain records of the amount of natural gas consumed and hours of operation for all engines and combustion sources.
2. Maintain records of testing conducted in accordance with the permit. Said records shall be maintained on-site or in a readily accessible off-site location
3. Maintain the corresponding records specified by the on-going monitoring requirements of and testing requirements of the permit.
4. Maintain records of the visible emission opacity tests conducted per the permit.
5. Maintain a record of all potential to emit (PTE) HAP calculations for the entire facility. These records shall include the natural gas compressor engines and ancillary equipment.
6. Maintain records of all applicable requirements of 40CFR60 Subparts JJJJ and OOOO.
7. Maintain records of the flare design evaluation.
8. The records shall be maintained on site or in a readily available off-site location maintained by MarkWest for a period of five (5) years.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates that MarkWest meets all the requirements of applicable regulations. Therefore, impact on the surrounding area should be minimized and it is recommended that the Harrison County location should be granted a 45CSR13 construction permit for their facility.

Jerry Williams, P.E.
Engineer

Date